To OCE
20 July 1979

KENNEBUNK RIVER
KENNEBUNKPORT, MAINE

SMALL BOAT NAVIGATION PROJECT
RECONNAISSANCE REPORT

Department of the Army
New England Division, Corps of Engineers
Waltham, Massachusetts
June 1979

DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
424 TRAPELO ROAD
WALTHAM, MASSACHUSETTS 02154

Joel — Please log in and place on Joe's shelf

REPLY TO
ATTENTION OF:
NEDPL-C

20 July 1979

SUBJECT: Kennebunk River, Kennebunkport, Maine, Reconnaissance Study

HQDA (DAEN-CWP-E)
WASH, DC 20314

1. Inclosed are two copies of subject Reconnaissance Report concerning small navigation improvements completed under the authority of Section 107 of the 1960 River and Harbor Act, as amended. The report indicates that a plan of improvement appears justifiable.

2. The plan of improvement being considered would provide a 10-foot deep, 100-foot wide channel extending from deep water for a length of 1,600 feet; thence, 8 feet deep for a length of 2,000 feet and culminating in a 75-foot wide channel, 8 feet deep for the final 2,000 feet.

3. It is requested that 96 x 3122, Construction General, Code 902-216 funds in the amount of $3,500 be provided at this time to reimburse the revolving account for expenditures to date. It is also requested that $10,000 be allocated at the time FY 1980 allotments are made for initiation of the Detailed Project Report, as the inclosed Project Cost Schedule indicates.

MAX B. SCHEIDER
Colonel, Corps of Engineers
Division Engineer

2 Incls
as

1. Authority: This reconnaissance report is submitted under the authority of Section 107 of the 1960 River and Harbor Act, as amended.

2. Purpose and Extent of Study: The purpose of this study is to determine the economic justification and the environmental acceptability for undertaking further detailed study of navigational improvements in the Kennebunk River. The study was developed using information obtained from the town of Kennebunkport, concerned citizens, and a reconnaissance investigation of the area.

3. Description: The Kennebunk River, located in southwestern Maine, flows in a southeasterly direction emptying into the Atlantic Ocean about 30 miles southwest of Portland and about 2.7 miles west of Cape Porpoise Harbor.

The Kennebunk River has a tidal range of 8.6 feet and its effect extends 3 miles up the river. The river's location can be found on Coast and Geodetic Survey Chart No. 1205, and U.S. Geological Map titled Kennebunk, ME.

Kennebunkport, situated 1 mile from the mouth of the river, borders the Kennebunk River on the east. The town, primarily, concerns itself with the commercial fishing industry and the seasonal, recreational services. Approximately ninety miles north of Boston, Kennebunkport is accessible via U.S. Route 1.

4. Economy: Bordering the eastern and western boundaries of the Kennebunk River are Kennebunk and Kennebunkport, Maine, respectively. Both communities depend largely on the year round commercial fishing industry for a major portion of their annual income.

Extending along the river for approximately one mile from the mouth are a number of commercial and recreational facilities. Included are two boatyards, two yacht clubs, several private marinas and a public wharf. The river's fishing fleet consists of 54 boats ranging in lengths from 30 feet to 55 feet.

In addition to supporting the commercial fishing industry, the Kennebunk River also attracts many summer tourists. The towns of Kennebunk and Kennebunkport, having a combined population of approximately 10,000 in 1978, concentrate heavily on servicing the seasonal overflow of tourists. During the tourist season, the river is utilized by many yachts, pleasure craft and private party boats.

5. Bridges: At the head of the existing project, a highway swing bridge crosses the river and has a horizontal clearance of 39 feet and a vertical clearance of 5 feet, MHW. There are no other bridges within the limits of the study area.

6. Existing Project: The existing project, as shown on the attached map, was adopted in 1829 and supplemented by enactments to 1962. It provides for the construction of a 550-foot long stone breakwater on the easterly side of the river's mouth; a pier or jetty on the westerly side about 290 feet long; and the construction of a wharf about 700 feet upstream from the shore end, this structure was transferred to the Treasury Department in 1936. It also provides for the construction of a jetty on the east bank, a channel 8 feet deep and 100 feet wide, extending 1,700 feet from deep water to the town landing; thence 6 feet deep over a width of 100 feet for a distance of 2,300 feet and a width of 75 feet for the remaining 2,000 feet. Other provisions are two anchorages, 4 acres on the west side of the channel and 2 acres on the east side, each 6 feet deep, and an extension of the west jetty by about 300 feet, supplemented by construction of a sand fence.

7. Other Development: The Arundel Yacht Club, located approximately 3/4 of a mile from the shore end of the river, has a history of periodic maintenance dredging. The most recent, privately contracted dredging of the club's basin occurred in the spring of 1978, since then no other dredging or related marine improvements have been made on the Kennebunk River.

8. Terminal and Transfer Facilities: There is a small landing owned by the town of Kennebunkport which handles all of the commercial fishing in the area. There are additional private marinas, wharves, and piers along the entire length of the river capable of handling large commercial fishing vessels and recreational boats.

9. Improvements Desired: The improvement requested by local officials, and considered in this report, is to deepen the existing channel to accommodate the larger commercial fishing boats. In addition, the town is desirous of expanding its anchorage space along the length of the river.

10. Existing and Prospective Commerce: Presently, commercial activity on the Kennebunk River consists of two boatyards, two privately-owned marinas, three party boats and two commercial fishing docks. Both boatyards are very active, as well as one of the marinas. The other marina only operates during the summer months. The fleet of party boats are estimated to amount to an annual income of $250,000. Of the two fishing docks, one is owned by the town and the other is a private enterprise. The

town-owned fishing dock is the only one that provides unloading facilities for the commercial fishermen. Town officials claim that the Kennebunkport fishing fleet of 54 boats yields an annual catch of 1,500 tons, valued at $3,675,000. Contributing also to the river's commercial industry are a number of refueling and boat repair yards utilized by approximately 250 vessels from both the Kennebunk River and Cape Porpoise Harbor.

Local interests and officials feel that future prospects for commercial development are likely. Navigation improvements are expected to bring about an increase in the fleet's annual catch. Four additional boats intend to utilize the Kennebunk River's unloading facility in 1979, as well as two sixty foot boats now under construction.

11. Vessel Traffic: At the present time, there are 57 commercial vessels based in the Kennebunk River. In addition, there are approximately 150 recreational boats and 400 transient vessels utilizing the river, primarily during the summer months. However, due to the lack of formal statistics concerning vessel trips, an approximation of 8,500 round trips per year has been made based on the available data. A more precise survey will be presented in the Detailed Project Report stage.

12. Difficulties Attending Navigation: The major difficulty in the Kennebunk River is the lack of depth to handle the larger commercial fishing vessels using the river.

13. Water Power and Other Special Features: There are no opportunities in the Kennebunk River for inclusion of water power, flood control or other water-related resources in considered improvements.

14. Project Formulation: At several meetings with Kennebunkport officials, alternative plans of improvement were discussed concerning the navigation study. All feasible plans have considered the need to dredge the study area to the depth required.

The quantities used in this report have been determined from a pre-dredge survey map dated June 1976 and a sweep map dated October 1977. An average depth procedure was used to calculate both the ordinary material and the rock quantities.

Based on similar projects in the Kennebunk River area, an estimated 5% of the ordinary material to be dredged was added to the total amount of rock found on the above-mentioned map.

As recent trends in the boating industry indicate, commercial fishing vessels will continue to increase in length and hold capacity, thus, a minimum depth of 10 feet MLW may be warranted. Two of the three alternative plans considered 10-foot channel depths. The channel's existing project widths, however, have not been altered because of the lack of available space along the river. In addition, there is limited knowledge about the areas that border the existing channel and determining the types and quantities of material to be dredged is beyond the scope of this report.

Based on the river's historical growth, the projected future fleet includes an additional 7 finfishing boats, 15 lobster boats and 2 party boats. Finfishing benefits are based on a probable 10% increase in catch due to the elimination of the present 2-3 hour tidal delay. However, this 10% increase will only pertain to the larger vessels, estimated to be 71% of the projected fleet. The projected fleet of party boats, with the elimination of time delays, will also see ar estimated 10% increase in their annual incomes.

The first alternative considered, known as Plan A, consists of a 10-foot channel, 6,000 feet in length extending from deep water in the Atlantic Ocean to the study limit. The designated channel widths in Plan A, as well as those in Plans B and C, reflect the widths of the existing federal project. Extending 4,000 feet upstream from deep water, the channel has a width of 100 feet. For the remaining 2,000 feet, the channel maincains a 75-foot width. The first cost of Plan A, as shown in Table I, has been estimated at $1,475,000.

TABLE I

PLAN A

Dredging (ordinary Material) 123,655 cy @ $4/cy	$ 494,620
Rock Removal 7498 cy @ $75/cy	562,350
Subtotal	$1,056,970
Contingencies (20%)	211,394
Subtotal	$1,268,364
Engineering and Design	101,469
Supervision and Administration	101,469
Subtotal	$1,471,302
Navigational Aids	4,000
TOTAL FIRST COST	$1,475,302
	say $1,475,000

Plan B provides for a 10-foot channel extending 1,700 feet from the river's mouth to the town landing, then from the town landing, an 8-foot channel will extend 4,300 feet to the study limit. Because of the narrow upstream channel width, large vessels are not likely to be found in that area. In addition, Kennebunkport's public wharf is presently the only unloading facility on the river. It is not probable that the larger, deep-draft vessels at the public wharf will find it necessary to utilize the upstream portion of the channel. The first cost of Plan B is shown on Table II. As indicated, Plan B has a considerably lower first cost than Plan A.

TABLE II

PLAN B

Dredging (ordinary material) 79,637 cy @ $4/cy	$318,548
Rock Removal 4971 cy @ $75/cy	372,825
Subtotal	$691,373
Contingencies (20%)	138,275
Subtotal	$829,648
Engineering and Design (8%)	66,372
Supervision and Administration (8%)	66,372
Subtotal	$962,392
Navigational Aids	4,000
TOTAL FIRST COST	$966,392
	say $966,000

Plan C, the last alternative considered, does not concern itself with the southerly 4,000 feet of the channel. The northern 2,000 feet of the channel, which has an existing authorized depth of 6 feet, would be deepened to 8 feet. However, this plan will not alleviate the river's problem caused by a lack of water along the southern portion of the river. The first cost of Plan C, as shown on Table III, is estimated at $792,000.

TABLE III

PLAN C

Dredging (ordinary material) 63,318 cy @ $4/cy	$253,272
Rock Removal 4171 cy @ $75/cy	312,825
Subtotal	$566,097
Contingencies (20%)	113,219
Subtotal	$679,316
Engineering and Design (8%)	54,345
Supervision and Administration (8%)	54,345
Subtotal	$788,006
Navigational Aids	4,000
TOTAL FIRST COST	$792,006
	say $792,000

The benefits accrued in both Plans A and B have been developed from the increased incomes of the finfishing fleet and the party boats plus an estimated reduction in damages valued at $10,000. Plan C does not provide ample depth for the deep-draft vessels, thus, these larger vessels, accounting for 71% of the finfishing fleet, will not see any benefits and will experience some damages. Benefits from Plans A and B amount to 29% for the total finfishing fleet, 100% for the party fleet and an estimated $2,000 in reduced damages.

The low first cost of Plan C is offset by the lack of economic justification along with inadequate improvements involved; consequently, Plan C is not a solution to the problems of the Kennebunk River. Although Plans A and B would solve the problems in the Kennebunk River, the lack of economic justification associated with Plan A as compared with the favorable analysis of Plan B, establishes Plan B as the selected plan of improvement. As shown in Table IV, Plan B has the highest benefit/cost ratio; consequently, Plan B is the most economically justifiable. Annual charges are based on an interest rate of 6 7/8%. Additional charges have been estimated for maintenance of navigational aids and an annual shoal rate of 2%. The shoal rate has been formulated on past maintenance dredging within the river.

TABLE IV

COMPARISONS OF BENEFITS AND COST

	Annual Benefits	Annual Charges	B/C Ratio
Plan A	103,000	119,000	.87
Plan B	103,000	78,000	1.32
Plan C	38,000	64,000	.59

15. Plan of Improvement: The proposed plan of improvement would provide a channel extending from deep water for a length of 1,700 feet, 100 feet wide with a depth of 10 feet MLW. The channel would continue upstream for another 2,300 feet, 100 feet wide with a depth of 8 feet MLW. The final 2,000 feet of the channel would be 75 feet wide and 6 feet deep.

If these improvements are provided, the Kennebunk River is expected to meet the future demands of the commercial fishing industry.

16. Shoreline Changes: The improvement considered is not expected to change the configuration of the existing shoreline.

17. Required Aids to Navigation: Specific navigational aids will have to be determined in the Detailed Project Report stage by the U.S. Coast Guard. However, an estimate has been made for this report based on similar waterways.

18. Estimate of First Cost: The costs involved in the proposed plan of improvement are based on the dredging of ordinary material and rock removal. The federal government will be responsible for maintenance dredging and the U.S. Coast Guard will provide and maintain all navigational aids.

PROJECT COST ESTIMATES

Proposed Plan of Improvement

Dredging (ordinary material) 79,637 cy @ $4/cy	$318,548
Rock Removal 4971 cy @ $75/cy	372,825
Subtotal	$691,373
Contingencies (20%)	138,275
Subtotal	$829,648
Engineering and Design (8%)	66,372
Supervision and Administration (8%)	66,372
Subtotal	$962,392
Navigational Aids	4,000
TOTAL FIRST COST	$966,392
	say $966,000

19. Estimate of Benefits: Benefits will be accrued by both the existing and prospective commercial fleets. The potential beneficiaries are the finfishing fleet and the party boat fleet. Presently, there are 14 finfishing boats and 3 party boats based on the Kennebunk River, some of which experience a 2-3 hour tidal delay. Due to this time delay, it has been assumed that the larger vessels are not recovering their potential catch. Based on the historical growth of the river, the projected fleet will consist of 21 finfishing boats, 55 lobster boats and 5 party boats. Therefore, it is estimated that the average catch will increase 10% for 71% of the projected fleet. The remaining 29% of the finfishing fleet is assumed to be smaller in size and therefore not adversely affected by a time delay. This 29% of the finfishing fleet, amounting to 6 boats, will yield the existing average annual catch per boat.

Considering the size of an average lobster boat, it is felt that the lobster fleet does not experience any costly time delays and consequently will accrue any benefits with the improvements. The projected fleet of party boats will see a 10% increase in their annual incomes with the reduction in time delay.

Additional benefits will be realized with the reduction in damages. Given an ample depth of water with Plan B, as assumed $10,000 in benefits will be added. The estimated benefits are presented in Table VI, VII, VIII, IX, and X.

TABLE VI

EXISTING FLEET

Type of Boat	# of Boats	Catch per Boat (tons)	Income per Boat ($)	Total Income	Total Operating Cost ($)	Profit ($)
Finfishing	14	98.4	214,286	3,000,000	2,250,000	750,000
Party	3	-	83,333	250,000	175,000	75,000
Totals	17					825,000

TABLE VII

EXISTING FLEET WITH IMPROVEMENTS

Type of Boat	# of Boats	Catch per Boat (tons)	Income per Boat ($)	Total Income	Total Operating Cost ($)	Profit ($)
Finfishing	10	108.2	235,730	2,357,300	1,767,975	589,325
	4	98.4	214,286	857,144	642,858	214,286
Party	3	-	91,667	275,000	192,500	82,500
Totals	17					886,111

TABLE VIII

PROJECTED FLEET WITHOUT IMPROVEMENTS

Type of Boat	# of Boats	Catch per Boat (tons)	Income per Boat ($)	Total Income	Total Operating Cost ($)	Profit ($)
Finfishing	7	98.4	214,286	1,500,002	1,125,002	375,000
Party	2	-	83,333	166,666	166,666	50,000
Totals	9					425,000

TABLE IX

PROJECTED FLEET WITH IMPROVEMENTS

Type of Boat	# of Boats	Catch per Boat (tons)	Income per Boat ($)	Total Income	Total Operating Cost ($)	Profits ($)
Finfishing	5	108.2	235,730	1,178,650	833,988	294,662
	2	98.4	214,286	428,572	321,429	107,143
Party	2	-	91,667	183,334	128,334	55,000
Totals	9					456,805

TABLE X

BENEFITS TO COMMERCIAL FLEET

Type of Boat	Profits from Table VII ($)	Profits from Table VI ($)	Net Benefits ($)	Profits from Table IX ($)	Profits from Table VIII ($)	Net Benefits ($)	Total Benefits ($)
Finfishing	803,611	750,000	53,611	401,805	375,000	26,805	80,416
Party	82,500	75,000	7,500	55,000	50,000	5,000	12,500
Totals	886,111	825,000	61,111	456,805	425,000	31,805	92,916

Total Commercial Benefits + Damage Estimate = Total Benefits

$92,916 + $10,000 = $102,916

say $103,000 Total Benefits

20. Apportionment of Cost: The first cost of construction of the considered improvement is apportioned 100 percent federal as all benefits are accruable to commercial navigation.

21. Estimate of Annual Charges: Annual charges are based on an estimated project life of 50 years and an interest rate of 6 7/8% for federal charges. The annual charges for the proposed plan of improvement are as follows:

ANNUAL CHARGES

A. Interest and Amortization ($966,400 x .07131)	$68,914
B. Annual Maintenance - 2% shoaling rate/year (1593 cy @ $5/cy)	7,965
C. Navigational Aids	1,000
TOTAL ANNUAL CHARGES	$77,879
	say $78,000

22. Comparison of Benefits and Costs: Benefits and costs have been developed as such:

Benefits	Annual Charges	B/C Ratio
$103,000	$78,000	1.32

23. Local Conditions:

(1) Provide, maintain and operate without cost to the United States, an adequate public landing with provisions for the sale of motor fuel, lubricants and potable water open and available to the use on equal terms.

(2) Provide without cost to the United States all necessary lands, easements and rights-of-way required for construction and subsequent maintenance of the project including suitable dredged material disposal areas with necessary retaining dikes, bulkheads, and embankments therefor.

(3) Hold and save the United States free from damages that may result from construction and maintenance of the project.

(4) Accomplish without cost to the United States alterations and relocations as required in sewer, water supply, drainage and other utility facilities.

(5) Provide and maintain berths, floats, piers, and similar marina and mooring facilities as needed for transient and local vessels as well as necessary access roads, parking areas and other needed public use shore facilities open and available to all on equal terms. Only minimum, basic facilities and service are required as part of the project. The actual scope or extent of facilities and services provided over and above the required minimum is a matter of local decision. The manner of financing such facilities and service is a local responsibility.

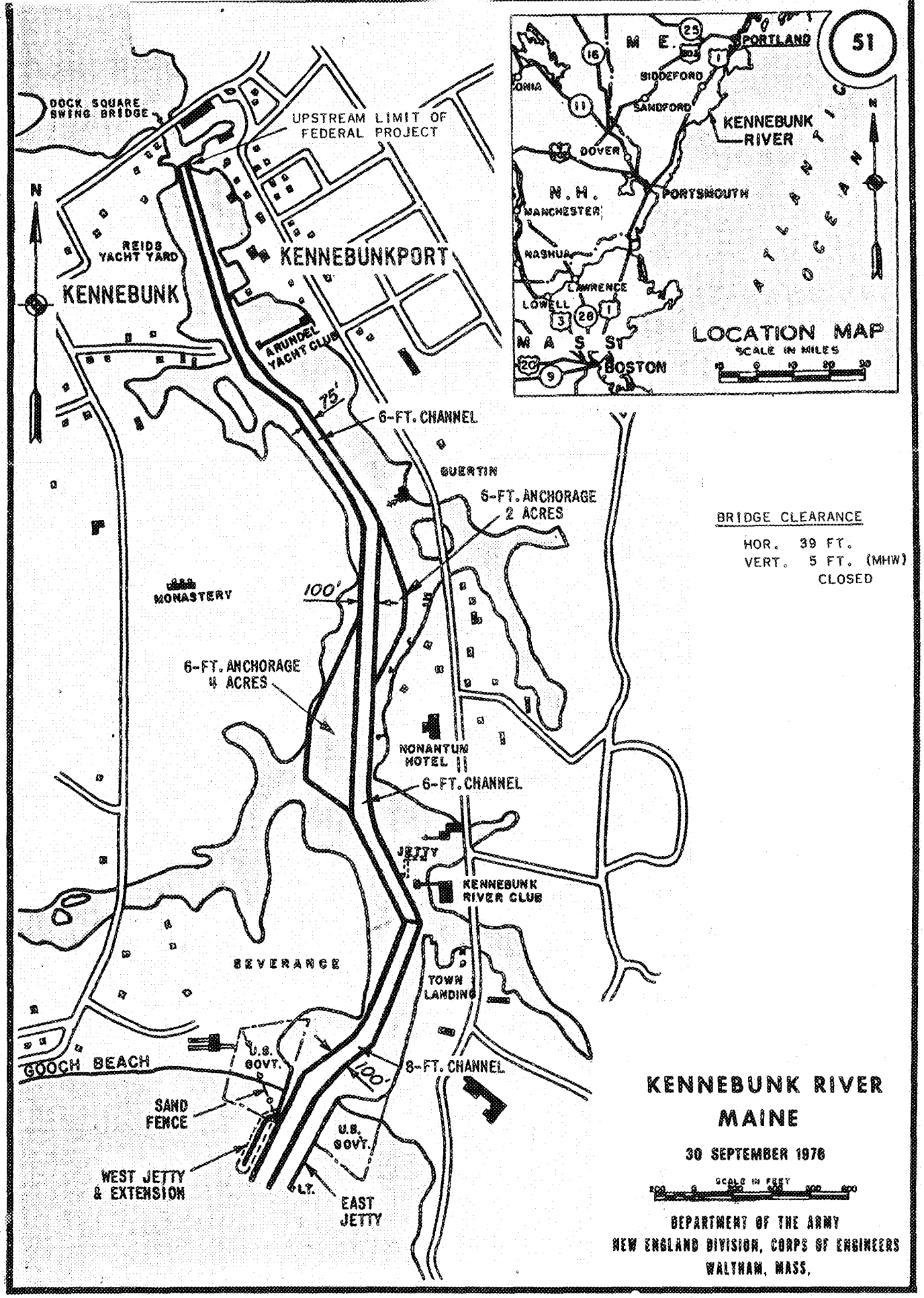
(6) Assume full responsibility for all project costs in excess of the Federal cost limitation of $2,000,000.

(7) Establish regulations prohibiting the discharge of untreated sewage, garbage, and other pollutants in the waters of the harbor users thereof, which regulations shall be in accordance with applicable laws or regulations of Federal, State, and local authorities for pollution prevention and control.

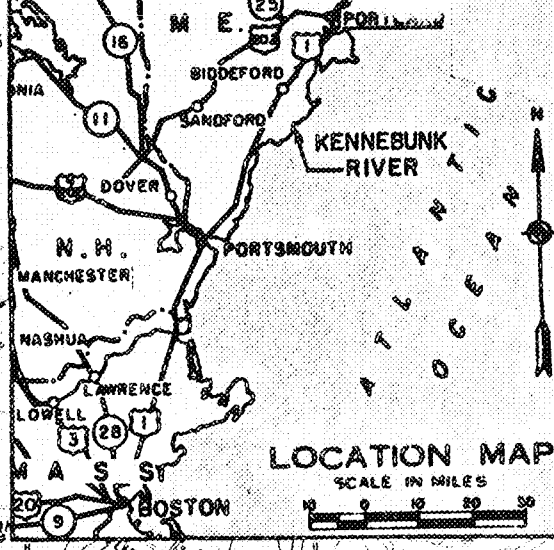
24. Environmental Impact: Environmental aspects of the proposed plan of improvement will be studied in the Detailed Project Report stage.

25. Correspondence: In a letter dated 11 July 1979, the town of Kennebunkport concurred with the findings of this report and recommended the Detailed Project Report be undertaken. The letter of concurrence is inclosed.

26. Recommendations: Further detailed study of the Kennebunk River, Kennebunkport, Maine is recommended.


51
DOCK SQUARE SWING BRIDGE
UPSTREAM LIMIT OF FEDERAL PROJECT
N
REIDS YACHT YARD
KENNEBUNK
KENNEBUNKPORT
ARUNDEL YACHT CLUB
75'
6-FT. CHANNEL
GUERTIN
6-FT. ANCHORAGE 2 ACRES
MONASTERY
100'
6-FT. ANCHORAGE 4 ACRES
NONANTUM HOTEL
6-FT. CHANNEL
JETTY
KENNEBUNK RIVER CLUB
SEVERANCE
TOWN LANDING
GOOCH BEACH
U.S. GOVT.
100'
8-FT. CHANNEL
SAND FENCE
U.S. GOVT.
WEST JETTY & EXTENSION
LT.
EAST JETTY
M E.
PORTLAND
BIDDEFORD
SANDFORD
KENNEBUNK RIVER
DOVER
N.H.
PORTSMOUTH
MANCHESTER
NASHUA
LAWRENCE
LOWELL
M A S S.
BOSTON
ATLANTIC OCEAN
LOCATION MAP
SCALE IN MILES
BRIDGE CLEARANCE
HOR. 39 FT.
VERT. 5 FT. (MHW)
CLOSED
KENNEBUNK RIVER
MAINE
30 SEPTEMBER 1976
SCALE IN FEET
DEPARTMENT OF THE ARMY
NEW ENGLAND DIVISION, CORPS OF ENGINEERS
WALTHAM, MASS.

KENNEBUNK RIVER
ENNEBUNKPORT, MAINE



PROPOSED PLAN OF IMPROVEMENT

A—Channel 100 ft. x 10 ft. M.L.W. x 1600 ft.
B Channel 100 ft. x 8 ft. M.L.W. x 2000 ft.
C···Channel 75 ft. x 8 ft. M.L.W. x 2000 ft.

SCALE
1000 0 1000
1 in=2000 ft

TOWN OF KENNEBUNKPORT, MAINE

– INCORPORATED 1653 –

MAINE'S FINEST RESORT

July 11, 1979

Colonel Max B. Sheider
Division Engineer
Department of the Army
New England Division, Corps of Engineers
424 Trapelo Road
Waltham, Massachusetts 02154

Small Navigation Study
Kennebunk River
Kennebunkport, Maine
Kennebunk, Maine
NEDPL - C

Dear Colonel Sheider:

Please be advised that we concur with the preliminary Small Boat Navigation Project Reconnaissance Report dated June 1979 of the Kennebunk River and request that initiation of a detailed project report be undertaken as soon as possible.

Sincerely,

Kennebunkport Board of Selectmen

cc: Peter Sargent, Chairman River Study
Steve Andon, Corps of Engineers
K.W. Barrett, Town Manager Kennebunk